бизнеса и управления телекоммуникационной компании «Казахтелеком», из чего даны рекомендации по адаптации процессов управления к цифровым изменениям.

Ключевые слова: Цифровая экономика, процессы управления, цифровая трансформация, цифровая стратегия, цифровая модель.

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CANVAS PROGRAM ROLE IN STUDENTS' ACHIEVEMENT: TECHNOLOGY ACCEPTANCE AND ACADEMIC RESISTANCE MODELS (ON AN EXAMPLE OF NARXOZ UNIVERSITY)

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ABSTRACT

The purpose of the study is to explore how Technology Acceptance (TAM) and Academic resistance (ARM) Models are working for Moodle and Canvas adoption at Narxoz University.

Methodology. The methodological basis of the study is an interview of 9 teachers. The interview focused on the teachers' perceptions and experience of using Moodle and Canvas platform. This study hypothesized TAM and ARM application for Canvas use.

The questions aimed to explore how TAM and ARM could explain the teachers' practice in Moodle and Canvas platform. Then data collected through interviews submitted to Atlasti. Any interest in using Canvas identified by Thematic analysis.

The originality / value of the research. The easy use of TAM is not properly working for Canvas. The contribution of this study to existing literature will be that no outputs of how TAM and ARM are working related to Canvas platform at Narxoz University.

Findings. In overall, most teachers are satisfied with quality of Canvas with some following suggestions for improvements:

- The use of Canvas by teachers related to ARM cognitive and emotional attitudes are different.

- The course design has the same structure. There is no any other imagination related to course design. Some functions of Canvas are obviously unclear for teachers.

- Canvas should help monitor students at risk for support. From this point of view, PLA (predictive learning analytics) system should work to monitor students' performance.

Keywords: Technology Acceptance Model (TAM), Academic resistance Models (ARM), predictive learning analytics (PLA), thematic analysis.

INTRODUCTION

Nowadays each university has its own study platform that helps to interact teachers 24 hours and 7 days a week with the students by providing teaching materials and discussion on issues risen from them. The key driven factors of such technology development are internet, mobile communication and social networks. Young generation is becoming digital that requires expanding communication tools from sides of universities. In particular, Narxoz University uses Canvas platform that is becoming obligatory to use. This qualitative research focused on the impact of Canvas on students' performance by interviewing 9 teachers at Narxoz University.

Background of the research. Recently Bayesian modelling, cluster analysis, predicative modelling as advanced machine techniques are adopted by higher education institutions to predict how students pass exams [1, p. 68]. The use of these machine techniques show how higher education institutions deal with students at risk. The support and interventions from the side higher education institutions maximize the potential of students. A bit of such evidence might be found in higher education [2, p. 180]. The problem of low students' performance lead to course warning signals to teachers and students. These advanced techniques are not applied everywhere.

The impact of Big Data Analytics (BDA) application to organizational performance is based on resource-based theory, which stands for organizational performance dependence on contributed resources [3, p. 3]. In addition, BDA provides competitive advantages to enhance organizational performance [4, p. 84].

To improve organizational performance companies increase knowledge through BDA adoption. However, some studies state a partial mediating of knowledge management between BDA adoption and organizational performance [5, p. 2]. Such relationship was stated also for HEI in Latin America [6, p. 5].

As a tool of BDA Learning Analytics expands its use for massively open online courses (MOOCs), dashboard applications, predictive modelling, E-learning, and etc. [7, p. 76]. In particular, Rash model can differentiate the students' performance [8, p. 115]. The principle of Six Sigma (SS) is used by public universities in the US [9, p. 15]. At the same time open data and Big Data are challenging issues for prospective solutions in the education [10, p. 58].

It is obvious that the use of education platforms is quite developed by applying new technologies. In the case of Narxoz University Canvas is used as teaching platform that's on the stage of adaptation and development. The qualitative research by interviewing 9 teachers shows some advantages and limitations of Canvas platform in dealing with students at risk.

The adaptation of new technologies leads to simplify or automatize some routines. In the case of Narxoz University Canvas system is not widely recognized teaching platform among students and teachers. This qualitative research by interviewing 9 teachers show how this platform was adopted easily by them. This study identifies the role of Moodle in improving students' performance and dealing with students at risk. In reality, the demanded education from labor market sets high requirements for students that lead to drop of courses as well. The emergence of such a problem early or late should be predicted and solved from the side of Canvas platform as well. These techniques are called as predictive learning analytics (PLA) that widely used in higher education [11, p. 11].

The university learning platforms play a key role in the quality of teaching and resource availability for students. In more advanced sense, it should deal with students at risk also. In author's personal experience of using Ulearn at Surrey university and Kazakh British Technical University's platform over 10 years ago were easy to use and useful than Canvas at Narxoz university. This reason lead author to do qualitative research on how Canvas meet teachers' expectations. The further quantitative research of students and teachers will be the next step to study. The use of theoretical framework specifically the principles of Technology Acceptance [12, p. 320] and Academic resistance models help to identify Moodle's impact on teaching practices, students' performance and support strategies for students' at risk.

The principles of Technology Acceptance and Academic Resistance Models have been widely applied to educational settings [11, p. 2]. However, this study devoted to how the principles of these models are working for Canvas platform at Narxoz University. The contribution of this study to existing literature will be that no outputs of how TAM and ARM are working related to Canvas platform at Narxoz University.

The interviews of teachers related to use of Canvas give an opportunity to reflect challenges, opportunities and limitations of this platform. By application of TAM and AR this study explores the experiences of ten teachers how actively they use Canvas for teaching. By triangulating the Canvas experiences, two research questions are risen to explore:

RQ1: How actively use teachers Canvas and its functions for teaching and student support?

RQ2: Which determinants of TAM and AR might explain the teachers' engagement into Canvas platform?

In order to answer to the research questions this qualitative research include the interviews of nine teachers at Narxoz University.

Literature review and theoretical base. Previous studies state that technology acceptance is conceptualised by the technology acceptance model that introduced by Davis et al. [13, p. 982] that shows teachers' information system of education acceptance as well [14, p. 3]. In brief, the TAM model is described as theory of Planned Behavior [15, p. 250]. The intention to perform lead to human behavior. The two key determinants such as perceived usefulness (PU) and perceived ease of use (PEU). As the another view of the cognitive and emotional terms are described by academic resistance model (ARM). In comparison with TAM the ARM describes specific beliefs, feelings and intentions of teachers.

Table 1 shows the main questions risen from the TAM and ARM. The questions are risen from these models also specify variables that should be analyzed.

In the table 1 three questions are assigned for TAM, five questions for cognitive attitudes in ARM, four questions for emotional attitudes in ARM, and two questions for intentions in ARM respectively.

The theoretical foundations of this study are TAM and ARM. The easy to use and perceived usefulness provide teachers' recognition of analytics importance in dealing with students at risk and teacher training. The cognitive attitudes of teachers will be enhanced if technology makes easier and efficiently their work. Emotional resistance to new technologies will be decreased if teachers systematically use them and intend to use in the future. This study estimated how teachers' behavior and attitudes are shaped around the use of Canvas at Narxoz University.

Table 1 – The interview questions based on Theoretical Models

#	Questions	Theoretical Models	Variables
1	What courses do you teach? What are your goals while teaching?	General question	Taught subjects
2	What are your first impressions of using Moodle and Canvas?	TAM	PEU/PU
3	What Canvas Control Panel Features do you often use? Was it easy to understand and use?	TAM	PEU/PU
4	Have you made any changes to your approach to learning because of the insights you received from Canvas?	ARM	Cognitive attitudes
5	Has Canvas validated your own intuition about which students might be at risk and how to improve their performance?	ARM	Cognitive attitudes
6	Have you taken any action when students were identified as at risk?	ARM	Cognitive attitudes
7	How did you feel about using Canvas in your practice?	ARM	Emotional attitudes
8	How can the quality of education and student performance be improved through Moodle?	ARM	Emotional attitudes
9	Do you have any concerns about using it?	ARM	Emotional attitudes
10	Do you foresee any problems?	ARM	Emotional attitudes
11	How does Canvas support teaching practice?	ARM	Cognitive attitudes
12	What intervention strategies are you developing to support students?	ARM	Cognitive attitudes
13	How can Canvas be used to develop course design?	ARM	Cognitive attitudes
14	Would you use Canvas systematically in your practice?	ARM	Intentions
15	What suggestions do you have for improving Canvas?	TAM	PU
16	What are your intentions to use Canvas in the future?	ARM	Intentions
Note – modified by author based on [11, p. 3]			

In this aim the principles of TAM and ARM identify the key determinants that were used for Thematic Analysis during data analysis. TAM and ARM guide for creating interview questions that provided by table 1.

In the study of Herodotou et al. [11, p. 3] the TAM and ARMs are applied in combination by supplementing together that might explain the reasons of PLA use. The ease of use and perceived usefulness explain the technology use by TAM. When ARM explains the technology use by individuals' attitudes to change. This approach is undertaken as the main direction for this study.

The TAM and ARM application into Canvas use at Narxoz University is guiding for interview of teachers. This study is based on work of Herodotou et al. [11, p. 4] that used a two-phase multi-methods methodology to explain how teaching experience is integrated with PLA.

As the difference this study is focused on TAM and ARM application in the use of Canvas that is existing just one year at Narxoz University. The Moodle platform was used before Canvas utilization. Most teacher are still experienced at Moodle. It was reasonable to study overall impressions of teachers related to Moodle as well as Canvas.

METHODOLOGY AND DATA ANALYSIS

Data collection procedures based on semi structured interviews of teachers at Narxoz University who commonly use Canvas. In order to explore research questions 9 individual interviews were conducted. The interview sample was small and self-selected that has potential biases. The distance study was an obstacle to reach more respondents. The interviews lasted between 20-30 minutes. The interview questions were open-ended. The interview focused on the teachers' perceptions and experience of using Canvas platform. Two interviews were conducted face to face. Other five of them preferred to use WhatsApp software.

This study hypothesized TAM and ARM application for Canvas use. Based on literature review of TAM and ARM characteristics the interview questions are consisting from 4 parts: 1) the background of teachers, 2) the Canvas impact on teaching, 3) the cognitive and emotional attitudes of teachers to Canvas, 4) the teachers' intentions to Canvas use. The questions aimed to explore how TAM and ARM could explain the teachers' practice in Canvas platform.

Then data collected through interviews submitted to Atlasti. Any interest in using Canvas identified by Thematic analysis. Thematic analysis was done in accordance with the aim of this study. The table 2 shows the themes and quotes of 9 teachers.

Qualitative analysis results. Interviewees answered to the questions about Canvas platform at Narxoz University. Table 2 shows the main topics and quotes.

Table 2 – Thematic analysis on the teachers' use of Canvas platform (n=9)

Themes	Quotes
Moodle and Canvas characteristics	"I compare the first impression of using the Moodle with the Canvas system when I was studying, it was a little bit complicated in understanding and the interface itself. The mobile app of Canvas was very good. Moodle is perceived as difficult." "The most difficult part to use and understand turned out to be the formation of a base of test questions."
Usefulness of Moodle and Canvas	"Canvas has all sorts of functions. We gave a lecture and asked. Initially, all materials are uploaded and we are asking for the Staccato method." "Editing view audio sound and help function where a lot of additional resources are given." "Through Canvas, you can use video materials in addition to lecture explanations of topics. You can use many additional tools such as the forum, chat, which are available in the Canvas in order to improve the interaction with students during training." "For example, the use of the Canvas platform revealed the need for a more scrupulous approach to the formation of the share of assignments in the assessment of term exams."

Dealing with students at risk	"On time and low grades suggest possible risks for the student." "Immediately create a group in WhatsApp and write about possible problems. Often the head of the group helps to find problem students. I give warnings."
Course design	"Basically, the emphasis is on the student's independent work. We use a ready-made template. We do not pay much attention to the course design."
Improvements to Canvas	"I would like the tests and tasks to be loaded automatically (new tests and tasks)." "Create a single access to the Canvas and Banner, for example, call the Narxoz online. Furthermore, specify functions for teachers and students. There is no student performance analytics. You can automate through history or repeat the course, and then change it as appropriate."
Teachers' intention to use Canvas in the future	"It depend on policy issues of university" "Yes. I would like to use it in the future."
Note – all results are interview outputs done by author	

In overall, most teachers are satisfied with quality of Canvas with some suggestions for improvement. One respondent compared with Canvas platform in the USA by revealing weaknesses. One interviewee is completely unsatisfied even through comparing with the study platforms of Kazakh British Technical University and Kazakh Institute of Economy and Strategic Planning.

Figures 1-6 show group coding components in tree base that was undertaken by Atlas.ti.
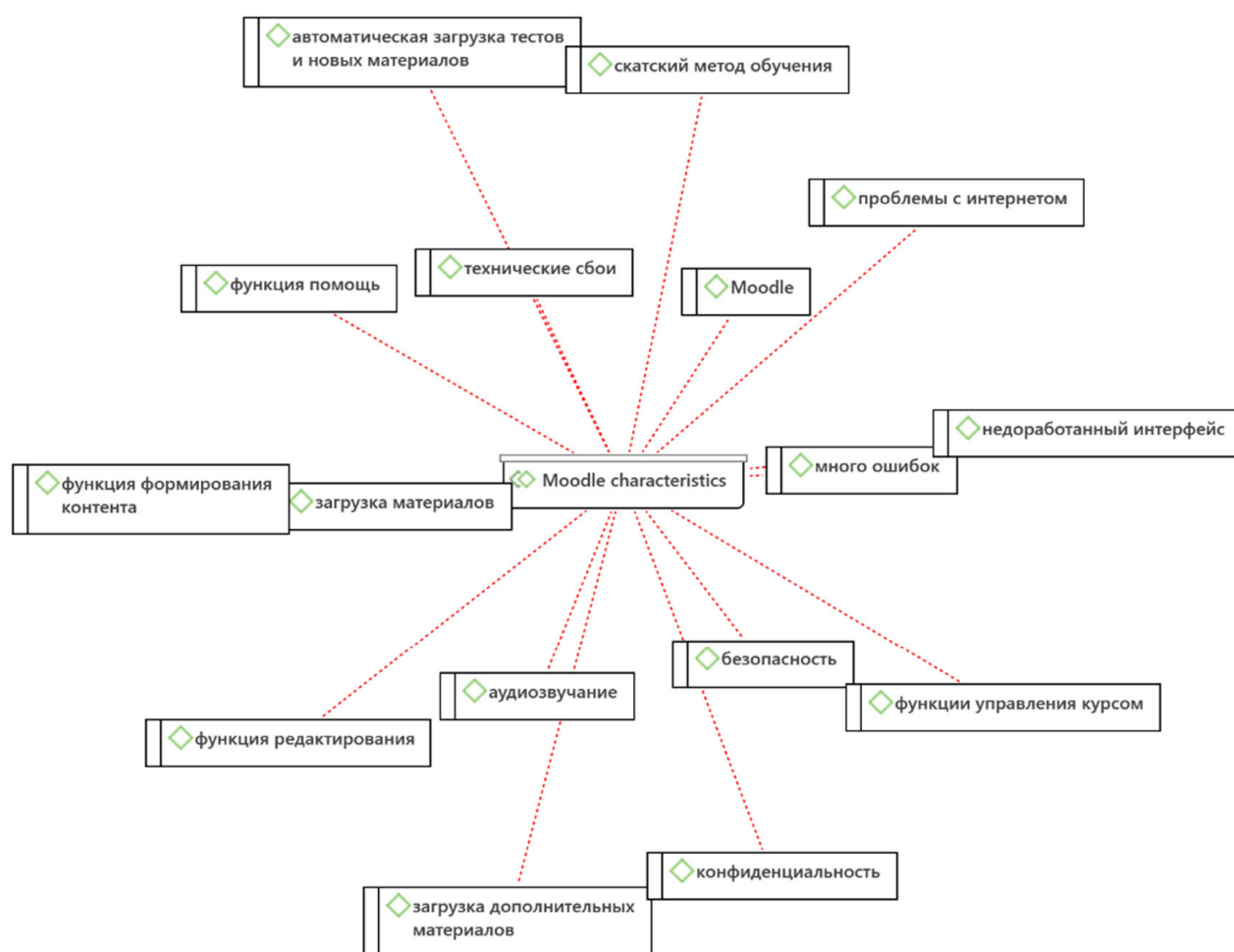

Figure 1 – Atlas.ti tree related to intentions to Moodle and Canvas characteristics

Note – all results are interview outputs done by author
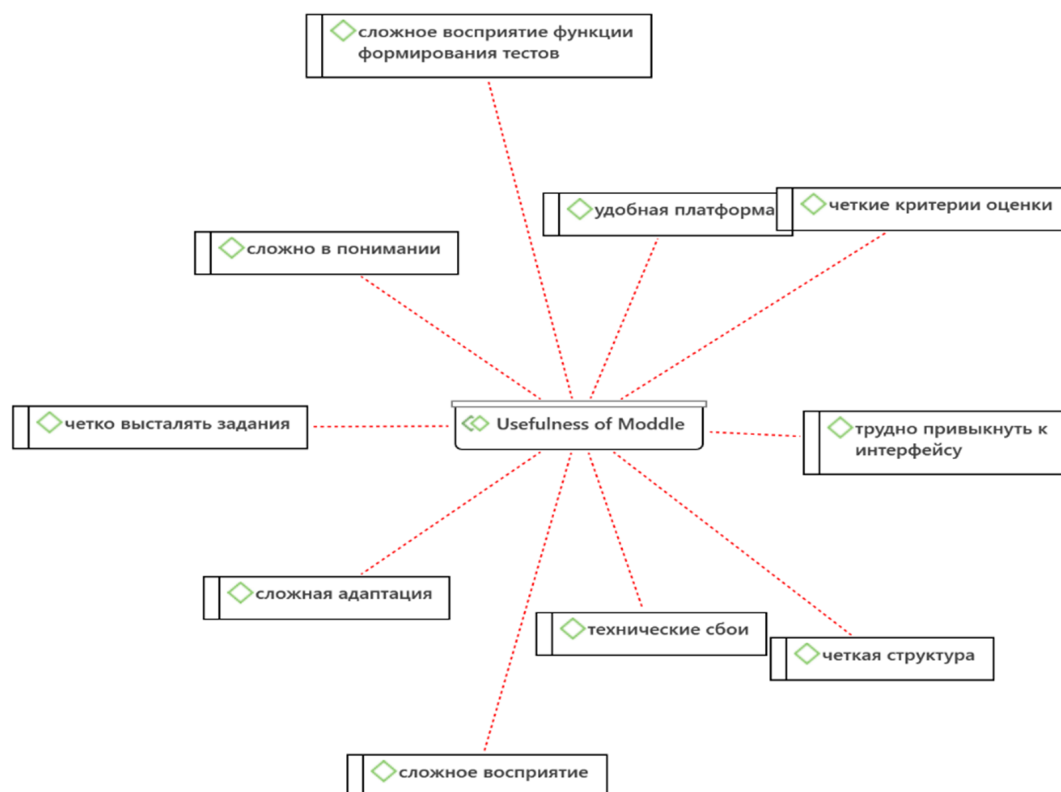
Figure 2 – Atlas.ti tree related to intentions to usefulness of Moodle and Canvas

Note – all results are interview outputs done by author

Figure 3 – Atlas.ti tree related to intentions to dealing with the students at risk

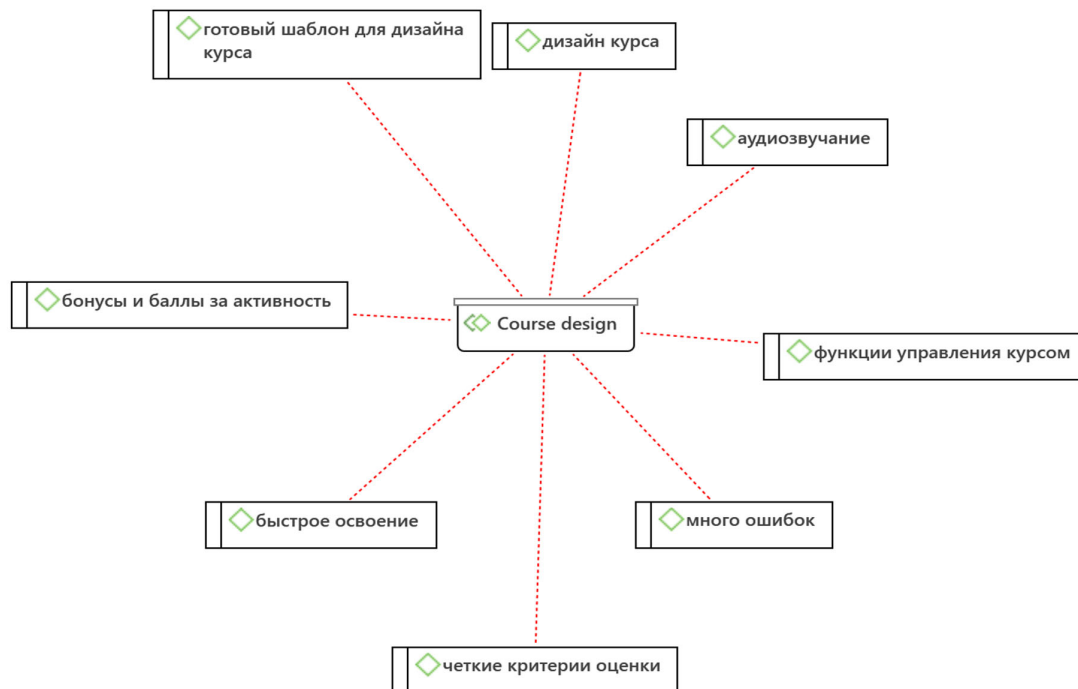Note – all results are interview outputs done by author

Figure 4 – Atlas.ti tree related to intentions to Course design

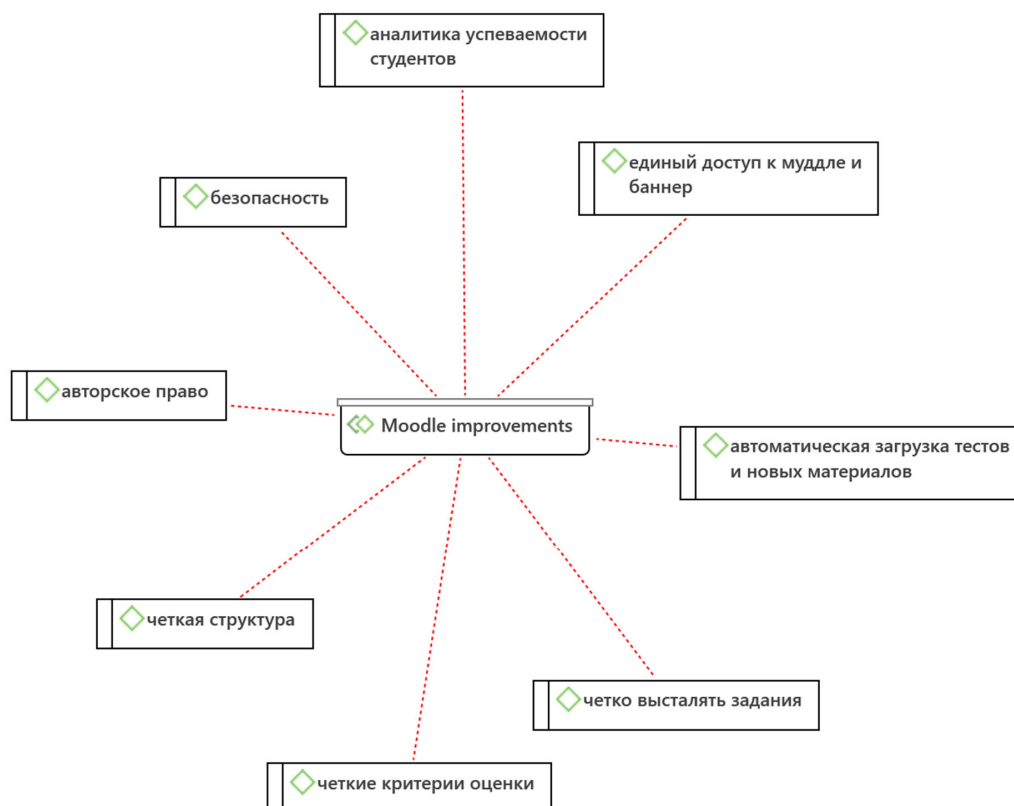Note – all results are interview outputs done by author

Figure 5 – Atlas.ti tree related to Moodle and Canvas improvements

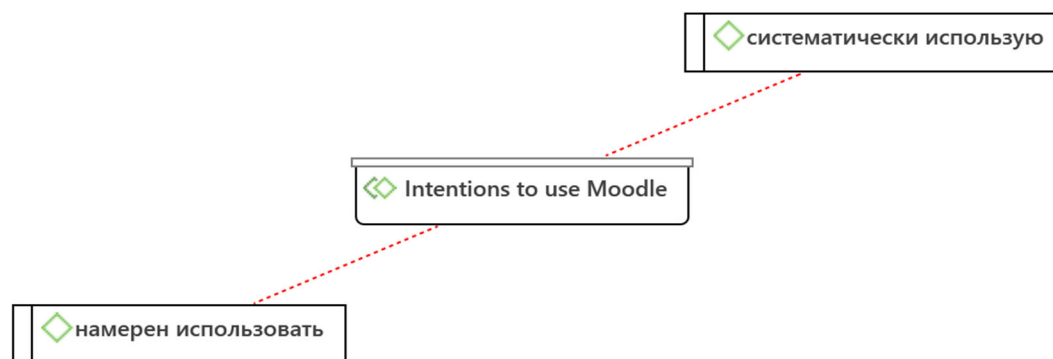Note – all results are interview outputs done by author

Figure 6 – Atlas.ti tree related to intentions to use Moodle and Canvas
Note – all results are interview outputs done by author

According to these figures most issues risen around the characteristics, usefulness of Canvas and course description. There is no evidence of deep analytics on performance of students. The teachers are also not so much caring on it. However, most teachers are willing to use Canvas in the future.

STUDY RESULTS (CONCLUSION)

This study about the use of Moodle and Canvas by 9 teachers at Narxoz University. The teachers taught different courses. Most of them from management and marketing field who are willing to participate to interviews regarding to professional interests.

The theoretical models TAM and ARM are partly working for Moodle and Canvas according the results of this study. More specifically, the easy use of TAM is not properly working for Canvas. There are many complains related to this issue. Moreover, the findings of this study revealed that the Canvas enhanced teaching practice by making a possibility to provide a range of materials including videos and other supplementary data. Also term assignment weights are clarified before running the course. So greater use of Canvas by some improvements can improve students' performance.

The use of Canvas by teachers related to ARM cognitive and emotional attitudes are different. Some teachers are satisfied and one of the respondents is completely dissatisfied. This respondent is suggesting getting experience from universities abroad.

Practically some teachers wish that the tests and tasks to be loaded automatically (new tests and tasks) and the procedures of test submission to be easier. One interviewee mentioned that «Create a single access to the Canvas and Banner, for example, call the Narxoz online. Further step is to specify functions for teachers and students. There is no student performance analytics. You can automate through history or repeat the course, and then change it as appropriate».

The course design has the same structure. There is no any other imagination related to course design. Some functions are obviously unclear for teachers.

The issue that should be properly monitored is supporting students at risk. From the side of the university the support students at risk needed improvements. The teacher and student interactions will also play as the support the students' performance.

The PLA (predictive learning analytics) system is not built yet or used properly [16, p. 930]. This system as the one part of big data technologies is widely used in foreign universities. For example, Early Alert indicators are going to be applied for Open University Analytics. The overall objective is creating intervention strategies across courses for students at risk before failing or not completing assignments [11, p. 2].

The main limitations of this project are: just qualitative method was applied yet; the sample size consists of 9 people, who are volunteered to participate in interview; not all functions of Canvas are familiar by teachers; the lack of PLA in Canvas; no systematic activity in supporting students.

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СТУДЕНТТЕРДІҢ ҮЛГЕРІМІНДЕ CANVAS БАҒДАРЛАМАСЫНЫҢ РӨЛІ: ТЕХНОЛОГИЯЛАРДЫ ҚАБЫЛДАУ МЕН АКАДЕМИЯЛЫҚ КЕДЕРГІ МОДЕЛЬДЕРІ (НАРХОЗ УНИВЕРСИТЕТІ МЫСАЛЫНДА)

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АҢДАТПА

Зерттеудің мақсаты – Нархоз Университетінде Moodle және Canvas қолдану үшін Технологияларды қабылдау (TAM) және Академиялық қарсылық (ARM) модельдері қалай жұмыс істейтінін зерттеу.

Әдіснамасы. Зерттеудің әдістемелік негізі 9 оқытушының сұхбаты болып табылады. Сұхбат мұғалімдердің Moodle және Canvas платформасын пайдалану тәжірибесіне және қабылдауына арналды. Бұл зерттеуде Canvas пайдалану үшін TAM және ARM қолданбалары гипотеза болды.

Сұрақтар Moodle және Canvas платформасында TAM және ARMге қатысты оқытушылар тәжірибесін қалай түсіндіре алатынын зерттеуге бағытталған. Содан кейін Atlasti-ге берілген сұхбаттар арқылы

деректер жинақталған. Тақырыптық талдау арқылы Canvas-ты пайдалануға кез келген қызығушылық анықталған.

Зерттеудің бірегейлігі / құндылығы. ТАМ-ды оңай пайдалану Canvas үшін оңтайлы жұмыс істемейді. Бұл зерттеудің қазіргі әдебиеттерге қосқан үлесі Нархоз Университетіндегі Canvas платформасына қатысты ТАМ және ARM қалай жұмыс істейтіні туралы нәтижелердің болмауымен анықталады.

Зерттеу нәтижелері. Жалпы алғанда, оқытушылардың көпшілігі Canvas сапасына қанағаттанады және жақсарту бойынша келесі ұсыныстары бар:

- ARM когнитивтік және эмоционалдық қатынасына байланысты оқытушылардың Canvas қолдануы әртүрлі.

- Курс дизайнының құрылымы бірдей. Курс дизайнына қатысты басқа іздемпаздық тапшы. Canvas-тың кейбір функциялары оқытушылар үшін анық емес.

- Canvas тәуекел тобындағы студенттерді олардың үлгерімін сақтау үшін бақылауға көмектесуі керек. Осы тұрғыдан алғанда, PLA (болжалды оқыту аналитикасы) жүйесі оқушылардың үлгерімін бақылау үшін жұмыс істеуі керек.

Түйін сөздер: Технологияларды қабылдау моделі (ТАМ), Академиялық қарсылық үлгілері (ARM), болжамды оқыту аналитикасы (PLA), тақырыптық талдау.

РОЛЬ ПРОГРАММЫ CANVAS В УСПЕВАЕМОСТИ СТУДЕНТОВ: МОДЕЛИ ПРИНЯТИЯ ТЕХНОЛОГИЙ И АКАДЕМИЧЕСКОГО СОПРОТИВЛЕНИЯ (НА ПРИМЕРЕ УНИВЕРСИТЕТА НАРХОЗ)

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АННОТАЦИЯ

Цель исследования – изучение жизнеспособности моделей принятия технологий (ТАМ) и академического сопротивления (ARM) для работы Moodle и Canvas в Университете Нархоз.

Методология. Методологической основой исследования является опрос 9 педагогов. Интервью было посвящено восприятию и опыту преподавателей в использовании платформ Moodle и Canvas. Это исследование выдвинуло гипотезу о применении приложений ТАМ и ARM для использования Canvas.

Вопросы были направлены на изучение того, как ТАМ и ARM могут объяснить практику преподавателей на платформах Moodle и Canvas. Затем данные, собранные в ходе интервью, были отправлены в Atlasti. Любая заинтересованность в использовании Canvas выявлен тематическим анализом.

Оригинальность / ценность исследования. Простое использование ТАМ не работает должным образом для Canvas. Вклад этого исследования в существующую литературу заключается в том, что отсутствуют исследования по влиянию ТАМ и ARM на платформы Canvas в Университете Нархоз.

Результаты исследования. В целом, большинство преподавателей удовлетворены качеством Canvas со следующими предложениями по улучшению:

- Использование Canvas преподавателями, связанными с когнитивными и эмоциональными установками ARM, различно.

- Дизайн курса имеет ту же структуру. Никакого другого воображения, связанного с дизайном курса, нет. Некоторые функции Canvas явно непонятны преподавателям.

- Canvas должен помочь контролировать студентов из группы риска для поддержания их успеваемости. С этой точки зрения, система PLA (предиктивная аналитика обучения) должна работать, чтобы контролировать успеваемость студентов.

Ключевые слова: модель принятия технологий (ТАМ), модель академические сопротивления (ARM), прогнозирующая аналитика обучения (PLA), тематический анализ.

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